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ABSTRACT

The primary purposes of this project were to develop catalogs of performance objectives and performance guides based upon validated tasks performed by incumbent workers and to disseminate and diffuse catalogs through inservice activities. The five catalogs developed were based upon tasks performed in the occupations of banking clerk, diesel mechanic, general house worker, meat cutter, and retail credit manager. All catalogs were developed utilizing the Vocational-Technical Education Consortium of States (V-TECS) uniform model. (The model is included in the appendices.) Another purpose of the project was to provide for the dissemination and diffusion of V-TECS Catalogs. Dissemination and diffusion activities were carried out utilizing the V-TECS Coordinator, a full time V-TECS inservice coordinator, and a slide/tape presentation designed for this purpose. (The narrator's script for the presentation is included in the appendices.) (Author/JH)

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FINAL REPORT

Project No. 498AH60026
Grant No. G007603605

A Project to Develop Performance Based Instruction Through Task Analysis and In-Service Programs - Final Report

Clarence E. Ledoux, Ed.D.
Divison of Vocational Education
Department of Education
Baton Rouge, Louisiana

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U. S. DEPARTMENT OF
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CE 022 454

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Ledoux, Clarence E.

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Department of Education, Division of Vocational Education,
Baton Rouge, Louisiana 70804

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INTRODUCTION

Vocational Education programs provide the knowledge, skills, and attitudes needed by individuals to become employable, obtain employment and to progress on the job. Effective vocational education programs are those attuned to today's labor demand and occupational requirements. In order for instructors to know what to teach, it is essential that they know what their students will be called upon to do on the job. By knowing which tasks incumbent workers perform on the job, a planned approach for the delivery of the needed knowledge, skills and attitudes can be provided. This has been a tenet of vocational education since its beginning. However, a reliable method for the determination of this information involves efforts of skilled researches and expensive data analysis devices. Ever changing technology keeps the labor demand and occupational requirements in a constant state of change thereby necessitating periodic updating of the needed knowledge, skills and attitudes.

Most states cannot, on their own, finance occupational analyses and task analyses for all occupational areas warranting the formation of vocational education instructional programs. Maintaining current occupational information for existing programs at the secondary and adult levels is a significant accomplishment for any state. In this case the State of Louisiana is no exception. Several southern states formed a consortium July 1, 1973 for the purpose of developing catalogs of performance objectives and performance guides in selected occupational areas. Louisiana joined the consortium in 1974.

In addition to catalog development, other benefits result from membership in the consortium. Duplication of effort is eliminated since a board of directors must approve the occupational areas for which catalogs are developed. Research and development is shared among members for each occupational area. Performance-based instruction is promoted and overall accountability improved. A significant reduction in cost of catalog development is realized since each member state shares its products with all other members. At this time 61 catalogs have been developed. Of these, Louisiana has developed ten. (See Appendix A for a list of catalogs.)

ADMINISTRATION

The project provides for a full-time technical coordinator, benefits, travel, and operational supplies. The job description of the technical coordinator can be found in Appendix B. The primary functions of the technical coordinator were to act as liaison between the State projects and the Consortium staff located in Atlanta, Georgia, and to serve as a technical resource person for project personnel with Louisiana. The consortium staff provided training for the technical coordinator to prepare him to carry out his functions. Even though the technical coordinator is responsive to the consortium staff, his direct responsibility is to his own State Director of Vocational Education.

Dissemination and Diffusion

The technical coordinator monitored the dissemination and diffusion project located at McNeese State University, Lake Charles, Louisiana, and coordinated the statewide in-service held at Louisiana State University, Baton Rouge, Louisiana. A commonly accepted need observed by those involved with V-TECS catalogs is the need to convert identified task performance objectives and performance guides into instructional delivery systems such as Individualized Learning Modules, Audio/Visual instructional materials and detailed lesson plans. The catalog development process defines that which incumbent workers do on the job and the catalog contains the tasks, performance objectives and performance guides which teachers and others can use in developing instructional materials for use by students preparing for employment.

A survey of existing audio-visuals revealed PIVOT materials that might fill the gap between the V-TECS catalog content and student achievement. PIVOT stands for Personalized Individualized Vocational Occupations Training and it is designed to teach specific industry tasks. In order to test the materials for effectiveness in teaching the tasks included in V-TECS catalogs, units for Carpentry, Building Maintenance, Electrical Construction, Electronics, Carburation and Ignition, Masonry and Communications were purchased and placed in existing secondary and post-secondary instructional programs. The instructors agreed to utilize the materials and respond to an evaluative questionnaire. A sample of the questionnaire is included in Appendix C. In order to do a better job of evaluating the materials, more time would have been needed actually utilizing the material in the shop setting. These results are based upon use over a three month period. Some conclusions that can be made include:

- Building Maintenance Tasks 1-20 are appropriate for Building Custodian and the steps in accomplishing the task are detailed and simple enough for slow learners.

- Carburation and Ignition Tasks 501-527 apparently are appropriate for use in Automotive training programs.

- Carpentry Tasks 33-41 are presented effectively in the sound-on-slide format. Some modification of the material is necessary depending on construction practices within the various regions of the country.

- Communications Tasks 33-41 -- No evaluation available.

- Electrical Construction Tasks 1-74 are apparently appropriate for use in post-secondary Trade and Industrial programs. Evaluation results indicated good or better for each criteria on the questionnaire.

- Electronics Tasks 1-42 are too basic for use in the two-year Industrial Electronics program, however, they appear to be appropriate for use in radio and T.V. programs.

- Masonry Tasks 1-11 are appropriate for instruction in laying of blocks. It is effective for group and individual instruction. Similar units on laying of bricks would be effective in a Masonry program.

Although the period over which the evaluations were made was short, it was evident that the materials need to be revised to suit individual programs. This may be accomplished by the instructor without too much difficulty and expense.

DISSEMINATION AND DIFFUSION THROUGH IN-SERVICE

In-service programs for the dissemination and diffusion of V-TECS catalogs under this grant were to be provided by teams of professional educators from the School of Education, McNeese State University, as it was done under a previous grant. However, a decision was made to hire an in-service coordinator who along with the technical coordinator would provide for the dissemination and diffusion of V-TECS catalogs. College teachers are limited in the amount of time they can devote to travel and in-service activities and to scheduling of available time. The result is inefficiency in terms of contact with vocational instructors. A full-time in-service coordinator and the technical coordinator were able to reach more schools and instructors.

The first task of the in-service coordinator was to assist with the completion of a slide tape presentation which would be utilized for dissemination and diffusion of the catalogs. The completed materials consist of a Participant's Manual, cassette tapes, and color slides. It is designed in four parts: (1) Introducing V-TECS, (2) V-TECS in Louisiana, (3) Utilization of the V-TECS Catalogs, and (4) the V-TECS Catalog Delivery System. The material may be used by individuals or with small groups - classroom size. Appendix D contains a copy of the narrator's script for each of the four parts. During the period of this grant many secondary and post-secondary vocational instructors were provided with catalogs and in-service training. Benefiting directly from the provisions of this grant were all vocational instructors in the parishes of Jefferson and Rapides and all instructors in Delta-Ouachita Vocational-Technical Institute, Hammond Area Vocational School, Northwest Vocational-Technical School, and Shreveport-Bossier Vocational-Technical Institute.

DEVELOPMENT OF CATALOGS OF PERFORMANCE OBJECTIVES AND PERFORMANCE GUIDES

The Louisiana State Department of Education, Division of Vocational Education, has contracted with two state universities to develop five catalogs of performance objectives and performance guides. Nicholls State University developed the catalog for the area of Banking Clerk, Louisiana State University at Baton Rouge developed the Diesel Mechanic, General Houseworker and Meat Cutting catalogs and the Southeastern Louisiana University at Hammond developed the catalog for the occupation of Retail Credit Manager. In each case the catalogs were developed utilizing the Phase II Model established for catalog development by the Vocational-Technical Education Consortium of States (V-TECS). By action of the V-TECS Board of Directors, the Phase II model Sub-Activity VI-2, Task Criticality Index, Sub-Activity VI-3, Task Difficulty Index, and Sub-Activity VI-4, Task Perishability Index are no longer determined. The complete Phase II model can be found in Appendix E. The model describes activities from the assignment of occupational areas for which catalogs are to be developed all the way through revision of the catalog. Each member of the consortium must utilize the model in developing catalogs of performance objectives and performance guides. A central office staff located in Atlanta, Georgia under the Commission on Occupational Education Institutions, Southern Association of Colleges and Schools, provides a quality control checkpoint for all products developed by the consortium. The central office staff also provides technical assistance to consortium members, in-service training of State Technical Coordinators and Project Directors and upon direction by the Board of Directors conducts studies and revisions of V-TECS administrative procedures and guidelines.

The following are V-TECS catalogs developed under this grant for the indicated Dictionary of Occupational Titles:

Catalog	D.O.T. Number	Job Title
Banking Clerk	216.388-014	Bank Reconciliation Clerk
Related Occupations	217.388-010	Proof Machine Operator
	217.388-014	Transit Clerk
Diesel Mechanics	625.281-010	Diesel Mechanic
General House Worker	301.474-010	House Worker
Meat Cutter	316.884-018	Meat Cutter
Retail Credit Manager	168.167-054	Retail Credit Manager

Abstracts for each of the completed catalogs can be found in Appendix F. The catalogs are being submitted under separate cover.

APPENDIX A

Completed V-TECS Catalogs

June, 1979

COMPLETED V-TECS CATALOGS

Advertising Artist
AG Parts Clerk
Auto Body Repairer
Auto Mechanic
Auto Parts Clerk
*Banking Clerk
Bank Teller
Bookkeeper
Bricklayer
Carpenter
Cashier/Checker
Child Care Attendant
Clothing Alterationist
Community Health Aide
Computer Operator
Computer Programmer
Cook
Cosmetologist
Cotton Ginning
Custom Dressmaker
Dental Assistant
Die, Jig, and Fixture Designer
*Diesel Mechanic
Emergency Medical Technician
Fire Fighter
Floral Sales
Floriculture Worker
*General House Worker
Greens Keeper
Grounds Keeper
Home Furnishing
Hospital Ward Clerk
*Hotel/Motel Desk Clerk
Housing Manager
Industrial Sewing
Janitor
Legal Secretary
Licensed Practical Nurse
Loom Fixer
Machinist
*Meat Cutter
Medical Assistant
Medical Lab Technician
Nursery Worker
Nurse's Aide/Orderly
*Patrolman
*Petroleum Technician
Plumber
Printing Occupations
Radio-Television Repairer
*Retail Credit Manager
Secretary
*Security Guard
Sheet Metal Worker
Ship and Boat Operations
Small Engine Repair
Tax Collector
Timber Harvesting
*Tractor Mechanic
Warehouse Worker
Water/Waste Water
Welder

*Catalogs Developed by Louisiana

APPENDIX B

Job Description

Technical Coordinator

In-Service Coordinator

JOB DESCRIPTION:

I. Technical Coordinator

The technical coordinator in each state belonging to the Consortium has two primary functions which are: (1) to act as a liaison between the state projects and the Consortium staff, and (2) to serve as a technical resource person for project personnel within the State. The technical coordinator has a key role in the success of projects in a particular state. The preparation and training of this person is vital to the proper functioning of the Consortium and, in particular, the activities within the State. Administratively, the technical coordinators are responsible to an administrator in the state but are expected to be responsive to the Consortium staff.

PROGRAM PLAN OF WORK

Within the state, the technical coordinator provides the services and performs the functions as follows:

(1) Monitors projects which are developing catalogs of performance objectives and criterion-referenced measures in accordance with the Memorandum of Agreement.

(2) Serves as a resource person for project personnel within the state during Domain Study activities.

(3) Reviews all reports and products developed within the state to assure that quality criteria have been met.

(4) Supervises the survey of incumbent workers (follow-up activities only) inside the state to assist in obtaining adequate responses to the task booklet.

(5) Serves as a resource person for the interpretation of task analysis data to personnel within the State.

(6) Assists in the preparation and training of personnel serving on writing teams to convert task analysis data and task statements to performance objectives.

(7) Provides techical assistance to project directors so that products are delivered on time and meet acceptable quality standards.

(8) Provides technical advice and assistance to personnel in the state during the field test, field utilization studies and implementation phases of the catalogs.

(9) Assists in the development of the state's dissemination plan in-service training plan for implementing the use of the catalogs of performance objectives and criterion-referenced measures.

JOB DESCRIPTION

Title: Coordinator of V-TECS In-Service Training

Duties and Responsibilities:

- Disseminate information on availability of V-TECS catalogs of performance objectives.
- Coordinate the in-service training programs for orientation to V-TECS catalogs with local education agencies.
- Provide technical assistance to local education agencies planning and implementing V-TECS catalogs.
- Coordinate a project to diffuse V-TECS catalog of performance objectives into individualized learning instructional materials.
- Develop information materials relative to V-TECS catalogs and their potential use.

APPENDIX C

3M Brand Sound on Slide Material
Evaluation

(Sample Form)

3M BRAND SOUND ON SLIDE MATERIAL EVALUATION

Evaluator: _____
(NAME)

School: _____
(NAME)

Materials Evaluated (Check appropriate box [XX])

- [ ] Building Maintenance Task 1-20
- [ ] Carburation and ignition Tasks 501-527
- [ ] Carpentry Tasks 1-19
- [ ] Communications Tasks 33-41
- [ ] Electrical Construction Tasks 1-74
- [ ] Electronics Tasks 1-42
- [ ] Masonry Tasks 1-11

	POOR	FAIR	GOOD	EXCELLENT	SUPERIOR
1.0 The Equipment					
1.1 is easy to operate by students	☐	☐	☐	☐	☐
1.2 is durable over periods of intensive use	☐	☐	☐	☐	☐
1.3 can be used for group instruction by the teacher	☐	☐	☐	☐	☐
1.4 is useful as a teaching tool for individualized instruction	☐	☐	☐	☐	☐
1.5 projects images satisfactorily	☐	☐	☐	☐	☐
2.0 The Prerecorded Sound Slide Discs					
2.1 contain appropriate tasks for the instructional program	☐	☐	☐	☐	☐
2.2 support step by step accomplishment of the stated tasks	☐	☐	☐	☐	☐
2.3 contain easy to understand recorded instructions	☐	☐	☐	☐	☐

	POOR	FAIR	GOOD	EXCELLENT	SUPERIOR
2.4 enable students to obtain needed instruction for successful completion	☐	☐	☐	☐	☐
2.5 are useful without revision	☐	☐	☐	☐	☐

Comments

Please use the rest of this page to comment on the strengths of these materials and on their weaknesses. Feel free to make any other comments you wish.

APPENDIX D

Narrator's Script

for

V-TECS In-Service

Narrator's Script

for

Part I

INTRODUCING V-TECS

INSTRUCTIONS FOR PROJECTIONIST

The cassette tape accompanying this slide set has an inaudible 1000 Hz pulse for synchronized showing with automatic equipment. If you are not using such automated equipment, follow the script and press the advance mechanism on the slide projector at the appropriate times.

1. ******** (5 sec.)
2. ******** (5 sec.)
3. ******** (5 sec.)
4. McNeese V-TECS Project presents ---
5. Introducing V-TECS!---The Vocational-Technical Education Consortium of States. V-TECS was founded in 1973 for the purpose of determining relevant current listings of vocational objectives.
6. Each person viewing this program should have their own copy of the PARTICIPANTS MANUAL. If you do not have one, get it now---before you proceed. You will need to make use of it several times during this presentation. Open your manual now and turn to page one.--------On page 1 you will see the general goals that we have for this first unit. You will also see the specific performance objectives that were determined for this unit. We feel that if you are going to be able to make effective use of the V-TECS materials---you need to know this information. The use of this manual will help make sure that you do.

   Look at the first objective. It says that you should be able to give the

complete and exact name represented by the term V-TECS. That is a reasonable expectation. You have both seen it---and heard it. Let's see if you know it. Turn to page two of the manual. In the space marked number one, write that complete name. Do it now. Restart the tape when you have the complete name written. If you are part of a group---you might wish to compare or discuss the answer you have written with a neighbor. Stop the tape NOW. (Pause.)

7. You should have written "Vocational-Technical Education Consortium of States". If you were not correct or complete, write it now-----Vocational-Technical Education Consortium of States. Important information is frequently missed unless you participate in the activities during instruction. That is why we call it a PARTICIPANTS MANUAL. We will be using the manual in this way very frequently. There are blank pages in the back of the book where you may take any notes that you wish. Do not refer to your notes when answering your manual questions. It is not a test! Be fair to yourself and see how much of it you really know without looking up the answer. You will then be sure that you do know the answers, when you do take a test later in the program. You will in all probability now remember---even if you missed it, that V-TECS stands for Vocational-Technical Education Consortium of States. As we proceed, take notes on the pages in the back of your manual.

8. The need for relevant vocational objectives, and teaching material to guide the student in his learning activities, has long been felt in Louisiana and many other states. This common concern led to the formation of what we now call V-TECS, a Vocational-Technical Education Consortium of States, consisting of these 16 states, mostly in the eastern-half of the country, and the U. S. Navy and the U. S. Air Force.

9. Students in all states and services are eager to learn skills that are saleable in the job market. They are in a better position to get---and hold a job if they can do what potential employers really need someone to do. Instructors must be sure that they are teaching what students will need in the real world of work. Too many students leave our schools with good grades, but with no saleable skills.

10. Job information is assembled in what is called a V-TECS catalog. A catalog is not a curriculum---as you will soon see, but it can certainly help broaden and enhance your curriculum.

11. Turn to page 2 in your PARTICIPANTS MANUAL. (Pause.) In the space provided under number 2, identify the membership of V-TECS. In the space provided for number 3, explain the primary purpose of the V-TECS consortium. When you are finished restart the tape. Stop it NOW. (Pause for answers.)

12. For number 2 you should have said that the Vocational-Technical Education Consortium of States is composed of 16 states, mostly in the eastern-half of the country, and the U. S. Navy and the U. S. Air Force. You may have said this in different order, but if you were not 100% complete and accurate, write in the correct answer. Incidentally, this correction or confirmation portion of our program is important. Be sure to follow this pattern throughout the program.

13. For number 3---the primary purpose of V-TECS is to develop relevant vocational objectives and teaching materials---to guide students in their learning activities. You may have said this in other words---but you should definitely have referred to the "relevance of the material---the use of specific objectives---and guiding students in their learning". These

items will be further explained as we go along. Add or correct any portion of this answer if it is needed.

14. V-TECS Catalogs are organized systematically into Competency Based Performance Objectives. Every student is given whatever assistance is necessary to reach a predetermined level of demonstratable competency on each objective. Much about CBI is not new. What may be new to you, however, is some of the terminology used and the preciseness of application to the principles.

15. By working together and using uniform catalog production techniques and standardizing format, consortium members can share products and obtain many more catalogs than any one could afford, or have the time and staff to produce on its own.

16. Many V-TECS catalogs have now been completed and validated, and are ready for use. You may be interested in this catalog on plumbing, or

17. This one on turf grass maintenance, or

18. This one on cosmetology. Catalogs will eventually number in the hundreds and cover a diversity of fields. Your PARTICIPANTS MANUAL contains a page that lists all current titles.

19. Let's check a few more points. Turn to page 3 in your PARTICIPANTS MANUAL. In the space provided for number 4, tell what is meant by Competency Based Instruction, CBI. For number 5, explain the value of a consortium. For number 6, list at least two subjects for which V-TECS catalogs have been developed. Restart the tape when you are finished. (Pause for answers.)

20. This may have been a little more difficult. For number 4 you should have written something like---"In Competency Based Instruction every student is given whatever assistance is necessary in order to enable him to reach a

pre-determined level of demonstratable competency". You notice the main points there of giving the student all necessary help,---and that the level of the demonstratable competency is pre-determined. The student knows in advance exactly what he is to do.

21. For number 5 you should have explained something to the effect that by working together and using uniform production techniques and standardized format, members of a consortium have the benefit of sharing products that they all need, and having available many more catalogs than any one member could afford to develop on his own.

22. For number 6---we mentioned only a few---plumbing, turf grass maintenance, and cosmetology. You may be planning to use another V-TECS catalog for a different subject area. We will accept any two that you may have named. There are many other titles finished or in the process of development.

23. Let's go back to the beginning and trace the development of a catalog. The process starts when someone proposes to produce a catalog of objectives in a specified occupational area. In V-TECS, a state may propose a new occupational area or one for which formal training is known to be needed.

24. The Consortium Central staff reviews the plan and helps the state's V-TECS Coordinator and catalog Project Director to conduct a careful study of the occupational area and a detailed task analysis.

25. This necessitates having numerous interviews with workers about the things that they actually do on their job. Existing materials containing task lists, equipment lists, and performance objectives for the particular occupational area are retrieved and analyzed.

26. This results in a preliminary listing of all tasks done on the job, and a listing of the tools and equipment required,---but this is only the beginning---and it is already much more than is usually done.

27. A group of vocational educators and a committee of incumbent workers review this information, and from it compile a Task Inventory Booklet. This Task Inventory Booklet is then given to a random sampling of workers in that occupation. They not only indicate which of the items on the list they actually do---or do not---perform, but they indicate the relative amount of time spent performing each task.

28. It is important that we do not spend time and effort teaching things that are not required of the real-life workers---just because we happen to think that they are important. V-TECS research has found that many of the things that schools have been, or are currently teaching, are totally unnecessary, while other needed skills and information are crowded out of the instruction.

29. This information is analyzed and the resulting data is used to determine which tasks and duties are relevant and necessary in the instruction. For each of these, Performance Objectives, Performance Guides, and Criterion Referenced Measurements are written. This information is placed in a Field Review Catalog. The title---Field Review Catalog---indicates that the process is still not finished. It is still under review. New groups of workers help by further reviewing and commenting on still needed revisions. When finally approved, a new catalog is then ready for use in the consortium states.

30. Turn to page 4 in your PARTICIPANTS MANUAL. For number 7, explain how a V-TECS catalog is developed. Restart the recorder when you are finished. (Pause.)

31. Your answers could vary considerably in wording, but you should have mentioned that a Project Director conducts a careful study and detailed task analysis of an occupational area. This is done by interviewing numerous

workers to make a list of everything that they do on the job---and the tools that they use. From this a committee of workers and vocational educators compile a task inventory list that is further refined. Tasks and duties are defined. For each of these, Performance Objectives, Performance Guides, and Criterion Referenced Measurements are compiled. This information is placed in a Field Review Catalog that is reviewed by new groups. After further study---and revision---when finally approved, it becomes a new catalog available for use in the consortium states. If you mentioned at least a few of these points, and noted the great amount of research---and the fact that the information comes from actual workers that are <u>doing</u> the job, we will accept your answer for now.

32. We have been using several terms that some of you may not be familiar with---at least not in this context. It is important that these terms be understood. Most of them are simply new names for ideas that have been used in education for a long time---but are now <u>better</u> defined and applied in a very precise way.

33. Many pages of the catalogs use several of these terms. Let's take a closer look at a typical catalog page to see exactly what we are talking about. There they are---terms like Duty, Task, PO, CRM, and PG. A later unit in this series will go into greater detail---but for now we will just introduce the ideas. Notice how the combined use of these points make a catalog different from ordinary curriculum materials. Remember, a catalog is <u>not</u> a curriculum.

34. Most catalogs contain information on several related duties that deal with the same occupation. A secretary, for example, may have duties dealing with typewriting, accounting, or filing. An automotive mechanic may have duties concerning brake relining, carburetor adjustment, wheel alignment---

or many other things. At the top of each page the duty under consideration is plainly stated. A duty is defined as a distinct major activity within the occupation.

35. Each duty usually involves the necessity of performing several tasks---a specific unit of work. The mechanic's duty of relining brakes involves, among other things, the task of removing the wheel.

36. A similar secretarial-computational duty may involve the tasks of writing checks---or taking inventory. Not only the duty,---but also the task is shown on the top of each page. Each such duty and task has been affirmed as necessary by employers and employees in real-job situations.

37. The catalog project team has written a Performance Objective (sometimes called a Behavioral Objective) that precisely states exactly what the student is to do. No vague terms like "understand", "know", "realize", or "appreciate", are ever used. The student must be told in observable and measurable terms---without any doubt---exactly what is expected to be done. Terms like "solve" (whose results can be seen), "explain", "list", and "discuss" are acceptable. Any applicable condition or standard is also told to the student in the Performance Objective. Whatever is stated here is exactly what is to be tested,---so it must be precisely stated.

38. Turn to the lower part of page 4 in your PARTICIPANTS MANUAL. For number 8 explain the way V-TECS uses the term "duty". For number 9 explain the way V-TECS uses the term "task". When you are finished, restart the tape. (Pause.)

39. In V-TECS we define "duty" as a distinct major activity within an occupation. You may recall the example of a mechanic's duty of relining the brakes on an automobile.

40. The term "task" is defined as a specific unit of work. Each duty usually contains several tasks. The duty of relining the brakes would include many specific tasks---among them the task of removing the wheel. You may be thinking of other examples, but be sure that you understand the way that the terms "duty" and "task" are used in the V-TECS Catalog.

41. The Criterion Referenced Measure is a statement of the unvarying way in which the student is to demonstrate accomplishment of the stated objective. The student's ability to perform is never compared to what someone else does; or compared to the average of what others do. That is the old "norm-referenced" grading system. The acceptable criteria to indicate fulfillment of any objective is stated very clearly, and the student is not finished until that criteria is reached. No one just "passes" with a grade of 70 percent---or 85 percent---or any other percentage---unless it was previously stated that that percentage would be satisfactory---otherwise 100 percent is the minimum criteria. They are simply just not finished with the task until they reach the stated level of performance. This is a Criterion Referenced Measure. Employers and customers have always judged workers on this basis. They want the job done correctly. In these days of increased demands for "accountability", schools must adopt the same criteria.

42. As you probably realize, students can rarely reach this criteria just by being told what to do. They need guidance in knowing how to do it---step-by-step instructions if necessary---to enable them to reach that point. The catalog calls this a Performance Guide.

43. For each task there are suggested curriculum activities designed to help the student achieve the corresponding performance objective.

44. From this guide the instructor may develop the instructional sequence, modules, packets, individualized methods, appropriate media---or whatever the situation requires.

45. Turn to page 5 of your PARTICIPANTS MANUAL. For number 10 give a brief definition of "Performance Objective". For number 11 define "Criterion Referenced Measure". For number 12 explain the term "Performance Guide". Restart the tape when you are finished. (Pause.)

46. You will be given further training on the use of Performance Objectives, but for now you should have been able to state that a Performance Objective is a precise statement of exactly what a student is to do. You might have added that it is stated terms that are observable and measureable---never a word like "know" or "understand". Any applicable condition or standard is also told to the student.

47. For number 11, a Criterion Referenced Measure is a statement of how the student will demonstrate the accomplishment of the stated objective. Students are to be judged by this criteria---they can do it as stated, or they can't---and not compared to what other students are able to do. They are not finished with the task until they can reach the stated terms of performance.

48. For number 12, a Performance Guide gives the student suggested activities and all step-by-step help that is necessary to achieve the desired objective. The instructor can use these Performance Guides to develop learning packets, modules, special media, or whatever the situation requires. If we had asked you to explain how V-TECS catalogs differ from usual curriculum aids, you would have had to include all of these special terms that we have been considering.

49. At this time you should go back to the objectives on page 1 of your PARTICIPANTS MANUAL. Review each of the objectives. We, too, are operating on the Criterion Referenced Measurement System. You will be asked to demonstrate that you can do everything---yes, <u>everything</u> that is stated in the objectives. If you are not comfortably positive of your ability to do <u>all</u> of them, refer to your notes or the answers to the questions that we have been asking. You may even wish to review all or parts of this program. Check yourself on each objective. You will then be ready for your Criterion Referenced Test. We don't care what others know---we want you to know it---<u>ALL</u>.

PART II

V-TECS IN LOUISIANA

1. ******** (5 sec.)
2. ******** (5 sec.)
3. ******** (5 sec.)
4. With the growing demand in Louisiana for accountability in all areas of education, we are having to justify to some extent never before required what we do,
5. why we do it,
6. and how we do it.
7. We fully expect this type of examination to continue and intensify---a reasonable expectation since we are spending taxpayers' dollars. V-TECS is one vehicle that can help us to be accountable.
8. In addition to the demand for accountability, Louisiana, like other states in the consortium, is faced with providing curriculum materials that are expensive to produce and time-consuming.
9. V-TECS can help stretch curriculum dollars and at the same time broaden the scope of the materials prepared by tapping human energies and skills throughout the consortium.
10. Louisiana, as are other states in the consortium, is contributing to the curriculum resources "pool" by both the writing of catalogs and the distribution of them. To prevent duplication, member states establish priorities within and among themselves to determine which catalogs will be developed and which states will have the responsibility for developing them.
    In Louisiana the field of catalog development for V-TECS Projects in 1976 included the following universities:

11. Louisiana State University at Baton Rouge is developing field catalogs in the areas of:

    Diesel Mechanics,

    Meat Cutter, and

    General Houseworker

12. The University of Southwestern Louisiana at Lafayette is working on a field catalog in the area of:

    Oil Field Technician

13. Southeastern Louisiana University at Hammond is working on a field catalog in the area of:

    Retail Credit

14. Nichols State University at Thibodaux is working on field catalogs in the areas of:

    Banking Clerk,

    Hotel-Motel Management,

15. Patrolman,

    Ship and Boat Operations, and

    Water and Waste Water Plant Operators

16. Please refer to the back of the PARTICIPANTS MANUAL to see a list of all completed catalogs that are currently available.

17. In catalog distribution, McNeese State University's V-TECS Project Team was engaged in a dissemination and diffusion program in 1976. The program that you are viewing was produced as part of that project.

18. A plan was designed that would provide orientation about V-TECS and would encourage implementation of V-TECS catalogs in the state of Louisiana. The project committee of eight members was assisted periodically by a field

advisory group of vocational teachers from two high schools in Calcasieu Parish and from Sowela Technical Institute in Lake Charles.

19. The early work of the McNeese Project Team was concerned with the orientation of its own members. Subsequent activities included an orientation program at McNeese for parish superintendents and/or their representatives from across the state, workshops for groups of teachers who were interested in the implementation of V-TECS catalogs in their classrooms, and other orientation activities out in the school districts as they were requested by parish administrators.

20. The designation of specialized assignments relative to V-TECS projects in the state of Louisiana is the responsibility of the Bureau of Vocational Education of the State Department of Education. The address that appears on your screen can be found toward the end of the PARTICIPANTS MANUAL.

21. The Bureau of Vocational Education further has the responsibility of keeping abreast of the progress made at individual project sites and of reporting such progress to the V-TECS executive office in Atlanta, Georgia.

22. ********

23. ********

24. ********

PART III

UTILIZATION OF THE V-TECS CATALOGS

1. McNeese State University presents---
2. part three of its diffusion and dissemination plan--the Utilization of V-TECS Catalogs.
3. V-TECS has a plan to keep the vocational instructor away from the 8-ball and give him the opportunity to tell his students exactly what is required.
4. Catalogs are being produced for each major job in vocational education to provide a framework to guide the instructor to a relevant and meaningful approach and to perform and perfect the total process of learning and teaching.
5. The purposes of the catalog are many, but the six major purposes are:
6. (1) The objectives of the catalog can be compared to the existing programs for possible inclusions.
7. (2) A Criterion Referenced Measure may be used to test the effectiveness of instruction in terms of measurable student achievement.
8. (3) Measures of the catalog may be used to determine entering student competencies, thus allowing the student to enter the job instruction at his own level of achievement.
9. (4) The measurement outcomes may be used to accept, improve, or reject an instructional system.
10. (5) This is definitely the most important purpose of the catalog. Since the catalog is not a curriculum, it provides an excellent blueprint or outline to design a complete curriculum tailored to each instructor's needs.

11. (6) The last purpose, but by no means of least importance, is the use of the Performance Guides. The Performance Guides provide the interim objectives to attain the final or terminal objective. The Performance Guides are the supporting objectives that must be mastered before the terminal objective may be achieved without difficulty.

12. Now turn to page 8 in your PARTICIPANTS MANUAL and answer question number 1. Stop the tape and restart it after you have answered the question.

13. You are not expected to remember all six purposes, but we will check them now and you may add those you forgot.

    (1) Compare existing programs.

    (2) Test for effective instruction.

    (3) Determine entering student competencies.

    (4) Outcomes used to decide on the system.

    (5) A blueprint for designing curriculum.

    (6) To develop interim objectives.

14. There are many systemized approaches devised for effective learning and teaching. Among the most common ones are Programmed Instruction, Modules, Competency Based Instruction, and Performance Based Instruction. V-TECS utilizes Performance Based Instruction namely because of its logical and everpresent utilization in vocational education.

15. However, regardless of what system is used, each is within the realm of Instructional Technology, which is a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific performance objectives. The systematic approach utilizes a basic framework of ten steps that explore every possible way to perform and perfect that total process of learning and teaching.

16. (1) The objectives must be stated clearly, precisely, and conclusively.

They must also be measurable and observable. The tests reflect exactly what was stated in the objectives.

17. (2) The instructor must know the student's entering competencies before a student can be placed at his level of achievement.

18. (3) The choice of methods is determined primarily by the objective. Other considerations are cost and availability.

19. (4) Next to the objectives, the choice of experiences is most important. The experiences should be the same as demanded by the objectives or similar to the experiences defined in the objectives.

20. (5) The selection of the materials, equipment, and facilities must be the best available for the needs of the particular objective.

21. (6) The final step before instruction is implemented is the assignment of personnel roles.

22. (7) We are now ready to implement the instruction.

23. (8) This step is of utmost importance because if we do not get any feedback, how are we to know if the instruction is accomplishing what was intended.

24. (9) The outcome is evaluated by the objectives.

25. (10) The last step is refining the process to assure that the instruction is doing its predesigned work.

26. Thus, we see that the basic systematic approach is a vicious circle with the student in the center. This is most important because everything must be done for the benefit of the student, not the teacher.

27. Now, stop the tape and answer question 2 on page 8 of your PARTICIPANTS MANUAL. When you have finished, restart the tape.

28. Check your answers and make any corrections.

You should have:

1. Define objectives.
2. Pretest the student.
3. Choose appropriate methods.
4. Choose appropriate experiences.
5. Select materials, equipment, and facilities.
6. Assign personnel roles.
7. Implement the instruction.
8. Get feedback.
9. Evaluate outcomes.
10. Refine the process.

29. Telling is not teaching. A lecture is like a shower. It is good for only 24 hours. According to research, the best way to learn is actually perform what is to be learned.

30. This is why Performance Objectives are the best way to learn. However, we need more than just performance to achieve the highest efficiency in learning.

31. The V-TECS program is most highly systemized. Therefore, to fully realize the potential, the instructor needs to follow through with the systematic approach.

32. Since the catalogs are not complete curricula, the instructor must understand how to implement them into a complete curriculum.

33. Before supplementing the catalog, we need to take a close look at the system utilized in the catalog. Note that all duties are subdivided into specific tasks. Each task is a complete unit with its own Performance Objective.

34. We are now looking at a typical task of typing labels under the duty of typewriting.

35. The Performance Objective for this task is, "Given five mailing labels, five file folder labels, five names with addresses and materials for correcting errors, type the labels. The labels must be typed in correct format with all errors neatly corrected".

36. The Criterion Referenced Measure is, "Your instructor will provide you with five file folder labels, five mailing labels, and names with addresses to be typed onto the labels".

37. The Performance Guide is outlined as follows:

    1. Select appropriate supplies.
    2. Make necessary machine adjustments.
        a. Set left margin (2-3 spaces from the edge of the label).
        b. Adjust line-space regulator for single spacing.
        c. Adjust paper bail rolls to hold labels in place.
    3. Insert the labels into the typewriter and begin typing on the second line from the top (or score line if file folder label).
    4. Proofread carefully, correcting all errors, before removing labels from the typewriter.

38. Thus, we see that each objective gives the term of the performance required, the conditions and the minimum standard. In this task, the minimum standard is no error or 100% correct.

39. All Performance Objectives must include the following: (1) term-which is the required performance, (2) the condition under which the student will perform the objective, and (3) the minimum acceptable standards.

40. The Criterion Referenced Measures are items designed to test student achievement of the Performance Objective. They provide test situations for the students.

41. The Performance Guides are an integral part of the objectives, but they provide a procedure or outline to successfully complete the objective.

42. The objective should leave no doubt in the student's mind as to what is expected of him.

43. The teacher should write out the objective in detail.

44. The term, conditions, and standards must be clearly spelled out.

    For example, here we have:

    Terms--File 25 documents

    Condition--Using numeric methods

    Standard--May make 3 mistakes or 3 documents may be misfiled

45. The Criterion Referenced Measure tells the student how he is to demonstrate the accomplishment of the objective.

46. The Performance Guides give the student suggested activities and all necessary step-by-step help that is needed to achieve the desired objective.

47. Now, turn to page 9 in your PARTICIPANTS MANUAL and answer questions A, B, C, and D of question 3. When you have finished, restart the tape.

48. A. The major divisions of a task within a duty are:

    1. Performance Objective
    2. Criterion Referenced Measure
    3. Performance Guide

49. B. The three elements of a Performance Objective are:

    1. Terms
    2. Conditions
    3. Standards

50. C. A Criterion Referenced Measure is a statement of how the student is to demonstrate accomplishment of the stated objective.

51. D. The Performance Guides give the student suggested activities and all necessary step-by-step help that is needed to achieve the desired objective.

52. To learn more about Performance Objectives and the systematic approach, refer to page 10 of your PARTICIPANTS MANUAL, Resources for Studying Performance Objectives.

53. Hopefully, the V-TECS program will give the student

54. a most brilliant future with a background of relevant skills

55. to procure a job that he can be proud to perform.

56. Music ********

57. Music ********

58. Music ********

Slide Tape Part IV (Narration)

THE V-TECS CATALOG DELIVERY SYSTEM

1. ********

2. ********

3. ********

4. This Unit IV media presentation is organized into two segments, the principal parties involved in the delivery system, and a description of the dissemination and diffusion project as initially planned and conducted.

5. The performance objectives for this unit are listed on page 11 of your PARTICIPANTS MANUAL. Let's identify them now.

   By the end of this unit, you, the viewer, will be able to meet four expectations. First, you will identify the five principal parties and/or agencies who have distinct roles in the V-TECS catalog delivery system. Second, you will match correctly some sample roles with each one's responsible party in the catalog delivery system.

   Third, you will complete an accurate definition of the term, "dissemination", as it applies to V-TECS processes and products (notably catalogs). Finally, you will complete an accurate definition of diffusion as it applies to V-TECS processes and products (notably catalogs).

6. Let's look now at the principal parties in the delivery system. You will notice that the V-TECS catalog delivery system involves at various stages in the program from one to five principal parties. They range from the V-TECS consortium executive office to the student in vocational training. We shall now give some attention to each of these parties.

7. There is first the executive office in Atlanta, headquarters of the administering agency for V-TECS, the Vocational-Technical Education

Consortium of States. This office is accountable to the Commission on Occupational Education Institutions of the Southern Association of Colleges and Schools.

The responsible roles of this office include coordination of the evolving program of catalog development and delivery, review of regular progress reports from member states, and final approval of catalogs before they are made available to member states.

A very unique service rendered by the consortium office is computer retrieval of precise job titles and printouts of miniature performance catalogs descriptive of those job titles. (Most V-TECS catalogs developed by member states embrace a broad occupational domain that includes a variety of specialized jobs.)

Generally, most communication between the V-TECS executive office and field areas is between the Atlanta office and a state's vocational bureau or designated representative, usually the V-TECS technical coordinator. A state's V-TECS technical coordinator may also serve on the consortium's board of directors.

8. The member state has several particularly important functions in the catalog delivery system. It assigns task responsibility to agencies and/or institutions, supervises progress of intrastate catalog development and distribution of catalogs, maintains effective liaison with the consortium executive office, and keeps a materials center of current catalogs available for distribution within the state. It also helps arrange for the distribution of catalogs to interested parties in the state who have met prerequisite stipulations.
9. The local teaching/training institution, agency, or parish is the third principal party in the delivery system. Its role includes an orderly

preparation and orientation of teachers for catalog utilization, the procurement of bulk copies of catalogs, and a continuous general evaluation of the effectiveness of catalog implementation.

10. Our fourth principal party, the teacher or instructor at the training site, has the unique role of realistic catalog utilization and adaptation, the singularly most critical service in the total delivery system. The preparation of the teacher for this urgent function may be met through avenues or procedures that are prescribed by the state, and the delivery of catalogs to the instructional site may follow the request by a teacher, but actual catalog implementation is left almost exclusively to the individual teacher's initiative, planning efforts, and perseverance.

11. The student or client, or fifth principal party, is the vital target person in the catalog delivery system. Catalogs are designed to help meet the job preparation needs of individual students, and it is this expectation that provides the driving force for the whole V-TECS program.

If given maximum use, the catalogs will reap these benefits for the students:

First, there will be attention to essential job performance expectations without unrealistic task assignments, inappropriate sequencing of activities, or redundant exercises.

Second, there will be activities of sequence and scope that are viable for the individual student's position in the program.

Third, the student will have immediate feedback as he progresses through the stages of training.

Finally, the program will concentrate on criterion referenced measures to gauge student performance. Satisfactory levels of realistic task performance are emphasized, not letter of grade designations.

12. Let's review now the principal parties in the catalog delivery system. There is first the V-TECS executive office in Atlanta, which performs central administrative and advisory functions for member states, and is accountable to the Commission on Occupational Education Institutions of the Southern Association of Colleges and Schools. There is next the member state; in our case, Louisiana, which participates in the consortium through its own Bureau of Vocational Education and its V-TECS technical coordinator. Third, there is the local school, agency, or parish most directly responsible for providing for the in-service needs of its teachers. There is next the classroom teacher or instructor, and finally, of course, the student or client.

13. Can you identify or describe one or two role expectations for each of these principal parties in the delivery system? Try it before we move to a description of Louisiana's V-TECS dissemination and diffusion program, which will deal largely with the orientation and preparation of teachers for catalog implementation.

    (The viewers may wish to discuss specific role expectations, either before or after referring to page 12 of the PARTICIPANTS MANUAL, and working the two exercises relating to the topic of "Principal Parties and Role Expectations in the V-TECS Catalog Delivery System".) Stop the recorder and restart when you are finished with the discussion and the two exercises on page 12 of the PARTICIPANTS MANUAL.

14. Are you ready for a check on your answers? For Exercise I, you should have listed all of the parties appearing on the screen now. Any order will do. You should have included the V-TECS Executive Office; Louisiana, or the member state; the training institution, agency, or parish; the local teacher or instructor; and the student, client, or trainee.

15. If you worked Exercise II correctly, then the following letters should have been placed in front of the numbers designated for these identified parties:

    You should have placed the letter "a" in front of the number you designated in Exercise I as the member state, of the state bureau of vocational education, or Louisiana. The letter "b" belongs in front of your number position for the student, trainee, or client. The letter "c" should be on the line in front of local training institution, agency, or parish. The letter "d" should be matched with V-TECS executive office, and the letter "e" belongs in front of your number designation for instructor or teacher. Are there any questions? If so, you may want to spend a few minutes in discussion and review before we move on to Part B of this media unit which will deal with dissemination and diffusion.

16. In the dissemination and diffusion of V-TECS catalogs, there is some modification in the designation of role participants and stages in the process. You are viewing now the principal steps in Louisiana's dissemination and diffusion program.

    The sequence of roles begins with the completed, approved catalogs being made available to the Louisiana Bureau of Vocational Education by the V-TECS consortium office in Atlanta.

    Before designated catalogs are placed in schools or training institutions, teachers representing those prospective field sites are involved in orientation and workshop activities where relevant job domain catalogs are utilized. (In 1976, McNeese State University's School of Education, through a grant from the State Department of Education, planned and conducted several such orientation and workshop programs.)

Following the required workshops, specific catalogs may be made available to the workshop participants for implementation with their students in instructional settings.

17. The experience of teachers, then, with catalogs begins with a concentrated workshop participation which promotes a demonstrated knowledge by the participants of the following:

First, a basic understanding of the principal steps in the development of V-TECS catalogs.

18. Second, some possible ways of implementing a given V-TECS catalog, such as the development of support activities, demonstrated teaching strategies, alternative sequencing patterns, and the development and utilization of modules.

19. Third, the identification of several support resources and references available to teachers to help in the effective implementation of a given V-TECS catalog. (You perhaps already noticed that there is a printed list of references and materials sources that accompanies this media "package". You might want to refer to it later.)

20. Let's review now the V-TECS delivery system in terms of dissemination and diffusion, the two designated responsibilities of the McNeese V-TECS Project team in the first calendar year of the grant, 1976. (Please note that V-TECS member states plan and implement their own dissemination and diffusion programs, and periodically report their stages of development and progress to the consortium office in Atlanta.)

21. Dissemination is the marketing process--getting the catalogs to site where they can be implemented. The V-TECS technical-reference handbook defines dissemination as "the mass reproduction, packaging, and distribution of

improved products of processes being advocated for use". Dissemination, then, essentially is the DELIVERY process.

22. Diffusion, the more critical process, is a combination of strategies designed to encourage and promote the actual USE of V-TECS products, notable catalogs. The diffusion process is defined as "all the change agent activities which promote, inform, demonstrate, train, help, service, and nurture the acceptance and USE of an improved product or process in vocational education".

    You will note that both processes and products are included in dissemination and diffusion. Steps in catalog development are examples of processes; V-TECS catalogs, of course, are examples of products. Remember that dissemination is delivery and that diffusion is use of products or processes.

23. Now, let's see if you can correctly complete the formal definitions of dissemination and diffusion. Turn to page 13 of your PARTICIPANTS MANUAL and work the exercise defining the two terms.

    Don't let alliteration in the heading get you off track.

    Stop the recorder. Restart when you have finished the exercise on page 13.

    Are you finished? Have you completed both definitions? If you're ready, then, here are the two terms and their comprehensive definitions. Listen carefully and check your own responses in your PARTICIPANTS MANUAL.

24. Dissemination is "the mass reproduction, packaging, and distribution of improved products or processes being advocated for use".

25. Diffusion is defined as "all the change agent activities which promote, inform, demonstrate, train, help, service, and nurture the acceptance and use of an improved product or process in vocational education". Make sure

your definitions of dissemination and diffusion are now essentially correct.

26. The McNeese V-TECS project in its initial year, 1976, had the responsibility of planning and providing impetus and direction to Louisiana's dissemination and diffusion effort. Concentrated attention was given to one V-TECS job domain catalog, entitled Secretarial, Stenographic, Typing, and Related Occupations.

The specifications of the first year of the project included:

(1) A representative inventory of tolls and equipment available to teachers to help implement a given V-TECS catalog;

27. (2) The planning, preparation, and conducting of in-service programs and workshops to encourage teachers to implement a given V-TECS catalog;

28. (3) The planning and conducting of orientation programs for administrators, supervisory personnel, and teachers in Vocational Education to introduce them to the V-TECS concept and its possibilities; and

29. (4) The production of media "package" that can be utilized in orientation and workshop programs, with or without the presence of project team members. (This presentation is part of that media product.)

30. What is envisioned for the future thrust of Louisiana's dissemination and diffusion effort in the V-TECS program?

It is anticipated that there will be follow-up activities in selected field areas to see how well catalogs already distributed are being implemented. It is projected that additional media products and "packages" will be developed and will be made available for general use across the state. It is intended that catalogs concentrating on different job domains will be introduced in some workshop programs. Continued efforts will be directed to further orientation so that V-TECS will become better known in the

"Pelican State", and the consortium's products and processes will be increasingly used and used effectively at vocational training and teaching sites.

31. If you have questions about V-TECS, or about Louisiana's participation in the consortium, you may direct your inquiries to:

The V-TECS Technical Coordinator

Bureau of Vocational Education

State Department of Education

P. O. Box 44064

Baton Rouge, LA 70804

32. ********

APPENDIX E

Phase II Model for the Development of V-TECS Catalogs

(PHASE II MODEL--DEVELOPMENT PURPOSES ONLY)

SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS
Commission on Occupational Education Institutions
Vocational-Technical Education Consortium of States

PHASE II MODEL FOR USE BY THE VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES TO MANAGE THE DEVELOPMENT PRODUCTION, DISSEMINATION, AND IMPLEMENTATION OF CATALOGS OF PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES IN OCCUPATIONAL EDUCATION

A Research Project

GLOSSARY OF TERMS

1. Catalog - A collection of performance objectives and companion criterion-referenced test items organized by domain area and further broken down by job titles within the domain.

2. Criterion-Referenced Test Exercise - A criterion-referenced test exercise is an excercise based upon a performance objective and is designed to allow the determination of whether or not the learner has accomplished the objective. It possesses each of the characteristics specified below:

   a. Congruence - The task specified in the item corresponds directly to the performance specified in the objective, including the situation, action, object, and limits.

   b. Comprehensibility - The item-specified task is so stated or portrayed that the learner clearly understands what is expected of him.

   c. Objectivity - The exercise (including component items, if any) is stated in such a way that all competent observers (evaluators) can make a clear and equivocal decision as to whether or not the learner has demonstrated an acceptable performance.

   d. Integrity - The exercise is structured in such a way that an acceptable response to the exercise constitutes sufficient evidence, in and of itself, that the learner has accomplished the corresponding objective.

   e. Equivalence - If two or more exercises correspond to a single objective, each exercise in the set would be a true alternate, in that a student who passes (or fails) one exercise on a given occasion would be expected to pass (or fail) any other exercise in the set.

3. Domain - A group of job titles which are closely related according to Vocational Education and Occupations, U. S. Department of Health, Education, and Welfare and U. S. Department of Labor, U. S. Government Printing Office, 1969.

4. Domain of Interest - The total content covered by a subject or occupation. Domain charts, as they become a part of a task analysis, provide the limits within which the performance objectives and criterion-referenced test excercises are developed.

5. Incumbent Worker - A person who participates in the survey of workers in business and industry, who holds a specific job at that particular time.

6. Instructional System - An integrated combination of resources (students, instructors, materials, equipment, and facilities), techniques, and procedures performing efficiently the functions required to achieve specified learning objectives.

7. Instructional System Development - A deliberate and orderly process for planning and developing instructional programs which insure that personnel are taught the knowledges, skills, and attitudes essential for successful job performance. This process is also known as Instructional System Engineering and Systems Approach to Training.

8. Job - The composite of duties and tasks actually performed by an individual.

9. Job Inventory - A listing of all tasks to be performed. A composite listing of job performance requirements and standards.

10. Job Performance Requirement or Standard - The tasks required of the human component of a system, including the associated standard of performance.

11. Occupational Analysis - The process of identifying duties and tasks which comprise workers' responsibilities, including the collection, collation, and analysis of such data.

12. Performance Objective - A performance objective is a statement in precise, measurable terms of a particular behavior to be exhibited by the learner under specified conditions. It possesses each of the elements or characteristics specified below:

    a. Situation - The situation confronting the learner is clearly specified, including the mode in which stimuli are to be presented.

    b. Action - The action required of the learner is unambigously defined, including the mode in which responses are to be made.

    c. Object - The object on which the learner is to operate (i.e., the object of the action) is clearly stated.

    d. Limits - The particular limits associated with the activity expected of the learner are specified. (Limits may be placed on situation, action and/or object.)

e. Measurability - The specified action is an observable rather than an inferred response.

f. Communicability - The objective is so stated that one, and only one, interpretation of the objective is reasonably possible.

g. Criterion - The degree of proficiency required as evidence of accomplishment by a student of the objective is indicated. (The criterion may be indicated implicitly or explicitly. If implicit, 100 percent accuracy is effectively designated. If explicit, it may be appended parenthetically to the statement of the objective.)

13. Duty - A distinct grouping of tasks which are related to each other by the nature of the work to be performed.

14. Task - A unit of work activity or operation that constitutes a logical and necessary step in the performance of a duty.

15. Task Analysis -The process of analyzing job inventory data so as to determine training requirements.

PHASE II MODEL FOR USE BY THE VOCATIONAL-TECHNICAL EDUCATION CONSORTIUM OF STATES TO MANAGE THE DEVELOPMENT, PRODUCTION, DISSEMINATION, AND IMPLEMENTATION OF CATALOGS OF PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES IN OCCUPATIONAL EDUCATION

INTRODUCTION

The following model is the result of a study of seven other models: those used by the Air Force Air Training Command, the State of Florida, the State of Michigan, the State of Alabama, Project CAREER within the State of Massachusetts, the Educational Testing Service, and the State of Utah. Components of the model were selected by the application of criteria taken from the Agreement Form of the Vocational-Technical Education Consortium of States (V-TECS), the minutes of the ad hoc Steering Committee which formed the Consortium, and the minutes of the Board of Directors, V-TECS. Some model components were the result of additional research conducted through an exhaustive study of the literature, a computer-assisted search of the ERIC files, a computer search of journal articles, and a manual search of the Dissertation International Index.

THE PHASE II MODEL

Activity Number I
Determination of Priorities and Assignment of Catalogs

This activity is the first step for developing catalogs of performance objectives and criterion-referenced measures. The activity has four basic sub-activities which form the rationale and consensus for catalog priority identification and assignment to the member states of V-TECS.

Sub-Activity I-1--State Priority Determination

The member states study data available to them concerning manpower needs, employment opportunities, and student interest surveys to establish a priority list within the state for catalogs of performance objectives and criterion--referenced measures. A state may consider regional and national data to determine its priorities or any other information which it deems necessary or appropriate.

Sub-Activity I-2--Consortium Priority Determination

The Board of Directors of V-TECS will discuss, in turn, the priorities established by each member state. The purpose of this structured discussion is to develop a priority listing from which the member states may select and be assigned a certain number of catalog to develop. This sub-activity is to assure that duplication does not occur and that a state has the opportunity to negotiate for specific catalogs in which it has a particular interest or for which considerable work has already been accomplished.

Sub-Activity I-3--Resolution of Conflict and Exchange of Previous Work Related to Catalogs to be Developed

Should states not be able to resolve priority preference conflicts, a drawing of assignments will be conducted by the Board of Directors. In case a state does not get its desired priority area for reasons identified by the Board of Directors, a copy of such accomplished work would be provided to the state assigned the catalog area in dispute. This material will be included as an essential part of the state-of-the-art study to eliminate duplication of effort.

Sub-Activity I-4--Assignment and/or Selection of Catalogs

The Board of Directors makes the decisions concerning the final selection and/or assignment of catalogs after state and Consortium priorities have been determined. Two primary considerations are given member states on the selection of a catalog:

(1) the state has a particular interest in a domain area
(2) the state has accomplished or has in progress considerable work in a domain area which would benefit the Consortium

Catalogs assigned by the Board of Directors of the Consortium are subject to acceptance by the state involved in the assignment.

Activity Number II
The Memorandum of Agreement

A Memorandum of Agreement is entered between the state selecting or being assigned a catalog to develop and the Consortium. The parties of the Memorandum of Agreement are the Chairman of the Board of Directors of V-TECS, the Executive Director of V-TECS, and the person designated by the State's Plan for Vocational Education as the State Director of Vocational Education. This activity has three sub-activities which must be completed prior to the developmental work on a catalog and they are as follows:

Sub-Activity II-1--Minimum Contents of the Memorandum of Agreement

The Memorandum of Agreement will be developed by the Consortium staff, and after a period of time, will be standardized. The Memorandum of Agreement will contain the following minimum items:

(1) date and name of catalog domain area including job titles to be surveyed
(2) designated signature blanks
(3) specific delivery dates for:
    (a) domain study and task lists
    (b) task analysis and survey results
    (c) catalog of performance objectives and criterion-referenced measures
    (d) field test period
    (e) final catalog and field test results
(4) responsibilities of a full-time technical coordinator in the state and to the Consortium
(5) Consortium staff involvement in the development of catalogs and the development of in-service training and dissemination plans

Sub-Activity II-2--Processing the Memorandum of Agreement

The Memorandum of Agreement will take the following course for development and approval:

(1) format developed and prepared by the Consortium staff
(2) Memorandum of Agreement reviewed and signed by the Chairman of the Board of Directors and the Executive Director of V-TECS
(3) Memorandum of Agreement mailed to the states for review and signature by the State Director of Vocational-Technical Education
(4) designated copies distributed and project starts
(5) periodic PERT reports are mailed to states on request

Sub-Activity II-3--Selection of a Project Director

Each state developing a catalog of performance objectives and criterion-referenced measures will select a person to serve as project director. The project director selects and manages writing teams which are composed of selected instructors in the domain being developed. These writing teams are trained by the project director and state technical coordinator to analyze the data resulting from the occupational analysis system, the findings of the state-of-the-art study, and other pertinent information. The project director is responsible for submitting to the state technical coordinator results of studies and analyses of data, catalogs of performance objectives and criterion-referenced measures, and other products required by the Memorandum of Agreement. The project director will meet the same qualifications established by the Board of Directors of V-TECS for the technical coordinator in each state.

Activity Number III
Technical Preparation of V-TECS Staff and State Coordinators

The technical preparation and training of the Consortium staff and the technical coordinators in the states are paramount to maintaining quality control. A program of technical development will begin with an orientation to the model to insure that technical skills and knowledge are sufficiently developed to provde maximum quality control. This activity is divided into six sub-activities which form the basis for staff preparation and training and are as follows:

Sub-Activity III-1--System Orientation

A program designed to insure the performance of Consortium staff and technical coordinators will be administered. The orientation is in performance terms with each person satisfactorily completing the required tasks at a criterion-based performance level. Orientation to the system will not be considered complete until the performance standards are met by the Consortium staff and the technical coordinators.

Sub-Activity III-2--Determining Decision Criteria

The Board of Directors and the staff of V-TECS will develop the decision criteria to be used in the determination of tasks to be converted to performance objectives for cataloging. The decisions will be based upon cut-off indices of time-spent, difficulty, criticality, and task perishability. Other bases for decision criteria may be developed by the Board of Directors based upon research of the data resulting from the surveys of the incumbent workers and their immediate supervisors.

Sub-Activity III-3--Interpretation of Task Analysis Data

An intensive training plan will guide the preparation of Consortium staff and personnel within the states to effectively utilize the data from the task analysis system. This training will assist personnel in the determination of index measures of tasks which are sufficiently high to use in a catalog. Optimum index rating scores will be developed when experience demonstrates that such a rating is feasible. Any tasks which fall below the desired index rating or combination of indice ratings will be excluded from conversion to performance objectives. Continuous training will be conducted for personnel as the task analysis system develops and the analysis of the research indicates a need for further training.

Sub-Activity III-4--Developing Skills in Writing Performance Objectives

Workshops, seminars, and conferences will focus on the development of skills needed to write performance objectives. Consortium staff and technical

coordinators will be expected to demonstrate their ability to take a given set of task statements and data, then develop written performance objectives and criterion-referenced test items.

Sub-Activity III-5--Writing of Criterion-Referenced Test Items

Following the training of the staff and technical coordinators in the skills of writing performance objectives from task analysis data and task statements, intensive efforts will be introduced to develop companion criterion-referenced test item(s) for each performance objective. A task statement will yield one or more performance objectives and a performance objective will yield one or more criterion-referenced test items. Criteiron-referenced test writing experts will serve as consultants for training Consortium staff and state technical coordinators. Personnel will either be sent to the source of technical expertise or the experts will be assembled in conference, seminar, or workshop settings.

Sub-Activity III-6--Monitoring and Quality Control of Personnel, Education and Training

The Consortium staff and state technical coordinators will develop individual plans of technical preparation for themselves under guidelines developed by the Board of Directors of V-TECS. These plans would serve as a guide to insure minimum competence levels of personnel of the Consoritum staff and within the states. The Executive Director of the Consortium has the ultimate responsibility for monitoring individual training programs of the Consortium staff and state technical coordinators in the states. The Board of Directors will receive at least a biennial status report of the technical preparation activities designed for the states. Reports of this nature may be requested any time the Board of Directors desires to know the status of the total plan or individual progress of personnel.

Activity Number IV
Domain Study for Catalog Development

The domain study consists of thorough and organized research of what has been developed in performance objectives and criterion-referenced measures which might be appropriate and helpful during the development of a catalog. A domain consists of a broad instructional area (such as automotive mechanics) and should include appropriate job titles (e.g. automotive tune-up mechanic, service station mechanic, service station attendant, front end and brake mechanic, general automotive mechanic). Activity IV consists of at least four sub-activities:

Sub-Activity IV-1--State-of-the-Art Study

This activity increases the probability that Consortium projects will find material which has already been partially or fully developed by others in a

domain area. The state-of-the-art study will include the following research activities as a part of the states' development of catalogs:

(1) a search of the ERIC system for germane information
(2) a search of the journal index of ERIC for germane articles
(3) inquiries to the U. S. Office of Education, National Center for Curriculum Development in Occupational Education
(4) selected inquiries to state department of education for germane material
(5) inquiries to industry and private training institutions
(6) review of the Dissertation Abstract International Index
(7) inquiry to local education agencies identified as working on germane projects

Sub-Activity IV-2--Task List Development

A comprehensive list of tasks performed by the incumbent worker will be developed as a part of the domain study. The task list will be based upon research completed in the state-of-the-art study (Sub-Activity IV-1) and, in addition, will include the following:

(1) a job structure arranged from the lowest job titles to the highest job title within a domain
(2) a coding system developed by the Consortium and identified in the Dictionary of Occupational Titles will be applied to the job structure
(3) development of a task list using the following sources for obtaining task statements:
    (a) review and observation of technical procedures used by workers
    (b) identification of existing task lists or statements from technical manuals and germane literature
    (c) interviews with incumbent workers and their immediate supervisors
    (d) use of craft committees and selected committees of instructors to identify incumbent worker tasks
    (e) provision of space for a survey of incumbent workers to add task statements not included on the list

Sub-Activity IV-3--Development of Background Information

This part of the domain study will be used in conjunction with the task list to provide data which may be cross-tabulated and studied with the companion task lists. The background information section will include as a minimum:

(1) information about the incumbent worker and/or supervisor
  (a) name and address of incumbent worker
  (b) date survey completed by incumbet worker
  (c) job title or classification
  (d) years and months of experience in career field
  (e) years and months of experience in present job title or classification
  (f) previous vocational-technical training
  (g) private or public school attendance
  (h) highest grade level completed or GED equivalent
(2) information about job satisfaction
(3) information about utilization of talents and prior training
(4) list of equipment and tools used in the jobs of the domain
(5) type of work environment and tools used in the jobs of the domain
(6) size of business or industry)

Sub-Activity IV-4--Reports of the Domain Study

The following reports will be required of the domain study activity:

(1) State-of-the-Art Study--This report includes the methods used to meet the requirements of Sub-Activity IV-1, (1), (2), and (3) of the model.
(2) Background Information and Task List--This report includes a comprehensive section on background data to be completed by all incumbent workers who are surveyed. Following this section will be a comprehensive task listing which each incumbent worker will be asked to verify in his job classification. He will also be given the opportunity to add any task he is performing which is not included. The background information and task lists will be printed, in booklet form, in a standard format set by the Consortium staff and approved by the Board of Directors.

Activity Number V
Development and Implementation of the Domain Sampling Techniques for the Task Statement Survey

The purpose of this activity is to obtain a sample of incumbent workers by a domain area and collect certain information from those sampled to be used later in a task analysis. Survey booklets of task statements are developed and printed using a standard format for the background and task statement information. The sampling design would be developed by an independent agency. This activity is divided into three sub-activities dealing with the sample design, sample administration, and processing of the survey results. Alternative procedures are included as a part of Sub-Activity V-1 and Sub-Activity V-2.

Sub-Activity V-1--Design of the Sample

(a) Optimum sample design--The optimum sample design consists of administration of the task statement survey to stratified random sampling of incumbent workers holding a job classified within the domain. The base data to be used in determining the sample size will be the occupational information (coded from the Dictionary of Occupational Titles) collected during the 1970 Census of the United States. The body of the information collected will be statistically analyzed with inferences made to the population. (All workers in the United States in a given job classification within a specific domain.)

(b) Alternative sample design #1--The alternative sample design #1 collects information using the same base data as in V-1 (a) but limits the sample to the member states of the Consortium and makes no inferences beyond those states not included in the survey.

(c) Alternative sample design #2--The alternative sample design #2 collects information using the same base data as in V-1 (a) but limits the sample to the state which is developing a task survey in a particular domain. A purposive sample could be used by any state desiring to validate task lists within a state not included in the survey.

Sub-Activity V-2--Administration of the Occupational Analysis Survey

(a) Optimum administration--The optimum administration of the survey would be conducted through a central staff in the Consortium office. This would permit control of the follow-up letters, follow-up telephone calls, and general sequence timing of the surveys. Limitations exist in the application of the optimum administration which are proportionate to the activities selected in Sub-Activity V-1.

(b) Alternate administration--An alternative method of administration would be to have each state which develops the task statement lists also conduct the survey of incumbent workers based upon the selection of the sample design in Sub-Activity V-1. This method is based upon a thorough development of a sampling administration criteria which will be used in the survey efforts. A subsample will be selected and individually interviewed on the work site to compare with the results of the mail-out survey.

Sub-Activity V-3--Processing the Survey Results

The results of the survey will be keypunched or optically scanned and computerized. Various analyses will be made of the data to make decisions about tasks performed by incumbent workers. These survey results will provide the basis for writing performance objectives and criterion-referenced test items. Indices of time-spent, difficulty, criticality, and perishability will provide the basis for strategic decision making. The analysis will be accomplished by using computer programs designed by the U. S. Air Force for this purpose.

Activity Number VI
Occupational Analysis System

The backbone of the Phase II Model is the system used to develop scientific task analysis information based upon a direct survey of incumbent workers. This effort should affect the quality, realism, and scope of the catalogs of performance objectives. The basic source document for the task analysis system is the task statement survey and background information collected from the incumbent worker. Activity Number VI has five basic sub-activities which make up the system of task analysis. These sub-activities have to do with computed indices of task time-spent, task difficulty, task criticality, task perishability, and computer analysis and reporting.

Sub-Activity VI-1--Task Time-Spent Index

The incumbent workers complete the background information and check the tasks they actually perform in the task statement booklet. After checking the task statement, the incumbent worker rates the relative amount of time spent on the task along a seven-point scale. The response on the scale is converted to a time-spent index based on percentages over the total group of task statements checked. The resulting percentage figure is cumulative to 100 percent on all tasks checked. This conversion of information and calculations is accomplished by use of a computer.

Sub-Activity VI-2--Task Criticality Index

The incumbent worker rates a task in terms of its critical performance. The primary interest of this part of the task analysis is to ascertain by use of a seven-point scale the index of criticality can be applied to the development of performance objectives. A thorough review of this critical index will identify the tasks which are most critical in descending order to those which are considered least critical. On the basis of these data, determination can be made regarding the consequences of a poor performance of the critical tasks.

Sub-Activity VI-3--Task Difficulty Index

The same process is used to calculate an index of task difficulty which is used in the determintaion of the time-spent index. A seven-point scale is again employed to determine the incumbent worker's perception of task difficulty. One additional step is included to determine the task difficulty index. The task statement survey is also administered to the immediate supervisor of the incumbent worker. The responses are then correlated, and the resulting figure becomes the difficulty index.

Sub-Activity VI-4--Task Perishability Index

The same sampling technique and incumbent workers are used to obtain a perishability index. This index is a measure, on a seven-point scale, of the

relative perishability of a task statement currently being performed by the incumbent workers participating in the survey. This index will relate to the need for retraining or refresher courses should the worker not perform, on a continuous basis, those tasks which are rated to have high indices of perishability. One implication of this type of index is to provide guidance for development of self-paced instructional packages which have as a basis the tasks which have the higher perishability indices. Retraining and development of materials could be minimized by including objectives for tasks which have high indices of perishability.

Sub-Activity VI-5--Processing of Data and Development of Reports

The information collected from Sub-Activity VI-1, VI-2, VI-3, and VI-4, will be computerized for statistical analysis. Information will be translated from qualitative data to quantitative data. The quantitative data will produce the index values of time spent, criticality, difficulty, and perishability. Many other statistical analyses can be applied to the data for the purpose of rank ordering, multiple regression analyses, cross tabulation of tasks with elements and sub-elements of the background information, etc. The resulting printouts will be furnished to the state developing the catalog of performance objectives and criterion-referenced measures as a basis for their developmental activities and decision making.

Activity Number VII
Development of Catalogs of Performance Objectives and Criterion-Referenced Measures

The activities prior to Activity VII have emphasized primarily the training and preparation of personnel, the collection and analysis of information, and other preliminary steps necessary to write and catalog performance objectives and criterion-referenced measures. This activity is the application state of the model. Information from incumbent workers is combined with the knowledge of selected instructors, curriculum specialists, criterion-referenced test designers, and educational researchers to transpose the resulting data into meaningful test items. Activity VII contains four sub-activities designed to accomplish this task which are as follows:

Sub-Activity VII-1--Selection and Preparation of the Writing Teams

(1) Selection of Writing Teams--The project director and technical coordinator screen possible writing team candidates and select those instructional personnel which they determine have the potential and interest to write performance objectives and criterion-referenced measures. The writing teams will consist of a minimum of one instructor, one technical writer, one person having demonstrated ability and experience in developing criterion-referenced measures and one person having either local or state supervisor responsibility over the

domain being developed. Each writing team should have a preferred alternate member who has responsibility in curriculum development at the local or state level. Exceptions to the writing team composition will be made upon request by the state developing the catalog. The request will be transmitted to the Board of Directors with appropriate justification for the exceptions. Decisions will rest with the Board of Directors.

(2) Preparation of Writing Teams--The state technical coordinator will have the primary responsibility of assisting the project director in the training of the writing team members. The total design of the model will be explained--the results of the state-of-the-art study, the task analysis system, and the conversion process from task statements to performance objectives. Companion criterion-referenced measures will be prepared for each performance objective incorporating performance standards which are used on the job when these standards are available. Components of the training program developed for the Consortium and state technical coordinators will be used as the basis for training and preparing the writing teams for their tasks.

Sub-Activity VII-2--Writing Performance Objectives

All performance objectives developed by the writing teams will meet the definitions and quality criteria set forth in the Memorandum of Agreement. The components of the performance objective will contain the following requirements: situation confronting the learner, action required of the learner, object on which learner is to operate, limits of performance, measurability of the action, communicability of the objective, and degree of proficiency required of the learner.

Sub-Activity VII-3--Preparing Criterion-Referenced Measures

Each performance objective will have one or more companion criterion-referenced test items to be used by instructional personnel. The test items will be studied to insure that a definite relationship exists between the criterion-referenced item and the standard of performance stated in the performance objective. The definition and components of an acceptable criterion-referenced measure are spelled out in the Memorandum of Agreement and will include: congruence with the performance objective, comprehensibility (expressed at a proper reading level for the level of the training program), objectivity of the test item, integrity expressed in terms of sufficient evidence that the learner can perform the corresponding objective, and equivalence within the test items. The criterion-referenced test items will be developed by the writing teams which develop the performance objectives under the technical direction of the person on the team with test item experience, the director of the project, the technical coordinator in the state, and the technical specialist on the Consortium staff. Particular emphasis would be placed upon explicit information concerning criterion of performance on-the-job and conditions under which performance occurs. Standards would be based upon those used by business and industrial workers.

Sub-Activity VII-4--Developing the Catalog of Performance Objectives and Criterion-Referenced Measures

The performance objectives and criterion-referenced measures will be coded by job classification within the domain being developed. This coding system will be developed by the Consortium and applied to all products of the Consortium. Catalog format and content are outlined in detail and are available through the technical coordinator in each state. All catalogs will be furnished in final draft form (camera ready) for mass production.

Activity Number VIII
Field Testing and Commonality Study

This activity is designed to determine the instructional acceptability of the performance objectives and criterion-referenced measures. The degree of validity will be determined by analysis of teacher and instructor reponses to questions during the field test portion of each project. Field test sites and conditions will be selected by the application of a criterion developed by the Board of Directors, Consortium staff, and technical coordinators. Activity VIII consists of four sub-activities as follows:

Sub-Activity VIII-1--Field Testing Design

The field test is designed to control the variables under which the catalogs will be tried by teachers and instructors. Controls are placed upon the selection of the site of field testing, supervisory and administrative support and interest, instructor or teacher interest and ability, type of facilities and equipment, and level of students (junior high schools, secondary, post-secondary, etc.) The primary emphasis is placed upon determining comprehensibility, utility, and appropriateness for instruction as perceived by the teachers and instructors. Constraints which prevent the use of a given performance objective and companion criterion-referenced measures are identified by the instructional personnel.

Sub-Activity VIII-2--Commonality Review

During the field test, several reviews of performance objectives are made by teachers and instructors for the purpose of identifying the common performance objectives across a wide group of occupational education programs. This commonality study identifies those common performance objectives within the catalog which are applicable in several occupational domains. The common core identified is analyzed for implications for curriculum design in general shop, prevocational, and comprehensive career education programs.

Sub-Activity VIII-3--Evaluation of Criterion-Referenced Test Items

A jury including an incumbent worker, a criterion-referenced test item writer, an instructor in the catalog domain area, and a supervisor of the

incumbent workers represented would be used to make a final review of the criterion-referenced test items. The primary purpose of this activity will be to reach congruence on the behavior being tested and to permit inference of competence should the learner meet the specified performance.

Sub-Activity VIII-4--Determination of Performance Objectives and Referenced Measures Which are Applicable to Handicapped Persons

The field test version of the catalog of performance obejctives and criterion-referenced test items will be reviewed by a committee of persons to determine their applicability to the training of handicapped persons. The appropriate performance objectives and criterion-referenced test items will be coded for each of the specific types of handicapped persons, i.e., partially sighted, speech defects, hard of hearing, crippled, and mentally retarded, etc. A special review committee for the handicapped will consist of a curriculum developer, an instructor from the catalog domain area and a representative of each of the handicapped groups who has the ability to determine the training limitations of handicapped persons in each group. The work of the committee will be coded and computerized for retrieval for use in planning realistic training programs for the handicapped.

Activity Number IX
Computerized Performance Objectives and Criterion-Referenced Measures

The primary purpose of this activity is to provide immediate response to the states' requests for catalogs. The computer banking of performance objectives and criterion-referenced measures eliminates the time-consuming and costly step of technical editing each time a catalog is revised and updated. Since only those objectives actually changed will be accessed from the computer, the majority remain unchanged and may be retrieved and printed in the same manner each time. Research capabilities, as well as many management possibilities, exist when the computer is used to do time-consuming calculations, compiling, and cataloging of performance objectives and criterion-referenced measures. This activity contains four sub-activities as follows:

Sub-Activity IX-1--Developing Computer Bank of Performance Objectives and Criterion-Referenced Measures

After field testing, the catalogs of performance objectives and criterion-referenced measures are processed and placed in a computer bank for rapid retrieval. The coding system adopted by the Consortium is the key to the retrieval system for the computerized information. The information is arranged so that it may be retrieved by domain area or any coded job within a domain. A member of the Consortium may request the total catalog or any of its sub-parts

for use in curriculum design and curriculum building. Information is recorded concerning the perceptions of the teachers and instructors during the field test and commonality review. These perceptions concern the comprehensiveness, utility, and appropriateness of the performance objectives and criterion-referenced measures for instruction. In addition, the perceptions concerning the commonality of performance objectives, across several programs in occupational education, are collected for analysis.

Sub-Activity IX-2--Research Aspects of the Computerized Performance Objectives and Criterion-Referenced Measures

(1) Field Test Data--Information collected during the field test activity is analyzed by the computer. the purpose of this analysis is to identify those performance objectives and criterion-referenced measures which appear to be defective. When the defective objectives and measures have been identified, they are forwarded to the state which developed the catalog with instructions for removing the possible defects.

(2) Commonality Review--The results of the commonality review by teachers and instructors form the basis for the identification of core performance objectives. This common core provides a basis for planning curriculum for pre-vocational, general shop, related subjects, and career education programs. These common performance objectives also provide a framework for prerequisite skills, knowledge, and abilities needed by students to further their preparation for employment at a higher level.

(3) Cross-analysis Research--Computer programs will be utilized which cross-tabulate and cross-analyze data received from teachers and instructors with data collected from the task analysis based upon surveys of incumbent workers and their immediate supervisors. The research implications of these data are unlimited when incorporated into the Revision and Updating Activities of the model.

Sub-Activity IX-3--Management of Performance Objectives and Criterion-Referenced Measures

The application of a code number to each performance objective, which relates it to a specific domain and, within the domain, to a specific job classification, provides an added degree of manageability. The performance objectives will be retrieved from the computer bank by job classification, by total domain, by commonality elements, or other mixes required for planning various training programs. The computer can be used to compile the catalog by printing out performance objectives in any desired structure or sub-structure within a domain. Training programs for a new or expanding industry may be designed and retrieved from the computer and can provide those performance objectives which correlate with the job structure of the new industry. The resulting performance objectives provide a realistic planning base for curriculum which must be tailor-made for the task at hand. Many other curriculum

management advantaged can be developed upon this computer bank of performance objectives. The curriculum design implications are limited only by financial resources and human ingenuity.

Sub-Activity IX-4--Development of Special Reports of Training the Handicapped Learner

The information collected from the work of the special committee for the handicapped (Sub-Activity VIII-4) would be computerized and used as a research base for developing, planning and organizing training programs and activities for the handicapped learner. The performances specified in the objectives and criterion-referenced measures could be modified to permit handicapped workers to demonstrate their ability in terms of particular job titles. Other valuable research could be accomplished by using the data concerning the abilities of the handicapped and comparing it with background information from the incumbent workers and their immediate supervisors.

Activity Number X
In-Service Education and Dissemination Plan

Each state using the materials of the Consortium will develop a comprehensive model for disseminating the catalogs of performance objectives and criterion-referenced measures. In addition, a comprehensive in-service training program must be developed which is designed to prepare both instructional personnel and supervisory personnel in the techniques of managing performance-based instruction. Performance-based instruction requires a thorough knowledge and new skills for teachers and their managers if it is to achieve the desired results. This activity contains sub-activities which are directed toward the achievement of an acceptable degree of implementation of performance-based instruction in the classrooms, laboratories, and shops of participating states.

Sub-Activity X-1--In-Service for Curriculum Developers

Specific programs will be planned for preparing curriculum developers concerning the use of catalogs for organizing learning activities. These programs are to be planned jointly with Consortium staff and include a comprehensive explanation of the system used to develop catalogs, the skills required for retrieving appropriate performance objectives and criterion-referenced measures, and the management strategies necessary to implement a performance-based curriculum effort in the classroom and laboratory. Strategies will also be included to provide direction in the organization and preparation of learning activities.

Sub-Activity X-2--In-Service Education for Teachers and Supervisors

A requirement of Consortium membership is the development, by each state, of an in-service education program for teachers and managers of teachers who

will begin to use the catalogs of performance objectives and criterion-referenced measures. The in-service program should be designed to instruct personnel on the intention of the catalog, how to select performance objectives and criterion-referenced measures, and how to supplement their selection with curriculum materials and student learning activities. Those who supervise, direct, or administer programs and have direct contact with the teacher who will be using the material should be trained in the management aspects of performance-based instruction. The basic requirements of the in-service education plan are developed and/or modified by the Board of Directors of V-TECS.

Sub-Activity X-3--Dissemination of Materials

A dissemination outline to be developed by the Board of Directors of V-TECS should serve as a guide for the states. The specific methods of dissemination are left entirely to the participating states. The Consortium staff will assist the states as needed and will encourage the dissemination plan to be integrated with the in-service education plan when at all possible. This integration should insure proper preparation of the users and manager of the learning process and, at the same time, provide a logical point of dissemination.

Activity Number XI
Revision and Updating of the Catalogs

The rapid rate of change in a technical society mandates a better way of keeping vocational-technical instructional materials up-to-date; but, more importantly, it mandates keeping them relevant to the needs of a modern job structure. This activity is designed to maximize input from instructional personnel, craft, adivosry committees, and the incumbent worker so that catalogs may be revised on a scientific an as-needed basis. This activity contains four sub-activities which form a cycle for revising and updating the catalogs. The cycle will take approximately three years to complete with a decision to revise and update or not to revise and update at the eighteen-month point in the cycle.

Sub-Activity XI-1--Field Utilization Study

Continuous field study is made regarding the catalogs of performance objectives and crierion-referenced measures. The purpose of the field study are to: (1) detect the defective performance objectives and criterion-referenced measures, (2) identify additional performance objectives which may need to be added to the catalog when it is revised, and (3) obtain a wider participation in the developmental activities, particularly in the area of curriculum materials.

The field utilization study has two major components for achieving the purposes:

(1) Teacher and Curriculum Developer Inputs--During the first year of use, the teachers and curriculum developers will be asked to react to questions concering readability, comprehensibility, specificity, and appropriateness of performance objectives and criterion-referenced measures. This information is added to the body of data already existing on the performance objectives as a result of the commonality study and the field test results.

(2) Craft Advisory Committee Inputs--Early in the second year, the craft advisory committees for the programs using the material review each performance objective and respond to questions concerning (a) the utility of the performance objective, (b) the appropriateness for present job requirements, (c) the extent to which the performance objective is accomplished by entry level employees, relatively experienced employees, and experienced employees, and (d) the relative criticality of the performance objective.

Sub-Activity XI-2--Analysis of Data from Field Utilization Study

The information collected from the field utilization study is computerized, and reports are developed to determine the results. Statistical analysis is applied to the data to accomplish the purposes of the field utilization study. Data are compared with the results of Sub-Activity XI-3, survey of incumbent workers, for the purpose of deciding whether the catalog should be revised and updated or if it is still sufficiently valid for continued use.

Sub-Activity XI-3--Conducting New Task Analysis

The same procedure used in Activity VI, task analysis system, is used at the twenty-fourth month point in the revision and updating cycle. The same task statements are used with the exception that those added by incumbent workers on the initial survey are included for this survey application.

Additional information requested of the incumbent worker is that he add any tasks he is now doing which do not appear on the list and place an asterisk by those task statements which he has begun to perform for the first time during the last twelve months.

Sub-Activity XI-4--Decision Criteria for Revising and Updating Catalogs

The information collected on the new task analysis is computerized and analyzed. The purpose of the analysis is to determine the extent of new tasks identified by incumbent workers which have been accomplished the first time during the immediate past twelve months. A review of the results of the field utilization study (Sub-Activity XI-1) and the survey of incumbent workers forms the basis for the decision regarding the need for revision and updating of the catalogs or portions of the catalogs. If the data suggests a need for revision, the catalogs are put through the same process as for their initial development.

Activity Number XII
Third Party Evaluation of the Vocational-Technical Education Consortium of States

Evaluation of the Consortium on a biennial basis is considered desirable by the Board of Directors of V-TECS. A third party evaluator will be selected on a low bid basis from a group of competent and qualified evaluators. This type of assessment has important advantages and will serve as a basis for self-renewal. This activity contains three sub-activities which are as follows:

Sub-Activity XII-1--Selection of the Evaluation Team

The Board of Directors of V-TECS will select a qualified low bidder as a third party evaluator from states or organizations outside the membership to evaluate and make recommendations concerning the total organization and its procedures. This evaluation shall occur within the first two years of the operation and every two years thereafter. The Board of Directors selects and employs the evaluators and sets guidelines for their study. These guidelines will be used as a basis for developing a well-defined and congruent request for proposals.

Sub-Activity XII-2--The Evaluation and Report of Results

The evaluation is conducted by a team selected by the Board of Directors. The chairman of the evaluation team will be selected by the successful bidder and the members of the evaluation team. The results of the evaluation are forwarded to the Chairman of the Board of Directors of V-TECS with a copy transmitted concurrently to the Director of the Southern Association of Colleges and Schools, the Executive Secretary of the Commission on Occupational Education Institutions, and the Executive Director of V-TECS.

Sub-Activity XII-3--Implementation of the Recommendations of the Evaluation

The Board of Directors of V-TECS reviews the evaluation results and directs the implementation of the recommended changes as it deems necessary and expedient. The administering agency files its response to the Board of Directors for consideration prior to implementation of recommendations made by the evaluation team.

APPENDIX F

Abstracts of V-TECS Catalogs

ABSTRACT

Leslie, J. Paul and others.

A Catalog of Performance Objectives and Performance Guides, Selected Banking Clerk Related Occupations.

Vocational-Technical Education Consortium of States, Commission on Occupational Education, Southern Association of Colleges and Schools, Atlanta, Georgia

Publication Date--January, 1979

Note--87 pp.

Available From: V-TECS, Southern Association of Colleges and Schools, 795 Peachtree Street, N. E., Atlanta, Georgia 30308

The introductory section of the Catalog explains the reasons for the formation of the Vocational-Technical Education Consortium of States and the research methodology. The Catalog's purpose is to provide performance objectives and performance guides relating to the job content of proof-machine operator, reconciliation clerk, and transit clerk. A state-of-the-art revealed that limited work existed in task analysis and performance objectives in the area of bank clerk occupations in the Louisiana banking industry. Having established a need for such a task analysis, a preliminary task list was refined through interviews with incumbent workers. From responses to an occupational inventory booklet, a task list was produced ordering tasks from greatest time-spent to least time-spent. A writing team provided performance guides; a technical writer furnished the performance objectives. A Final Catalog incorporated revisions and corrections from a Field Review version. Suggested uses of the Catalog include: (1) performance objectives may be compared to existing program content for possible inclusion or adapted as the basis for new curriculum development; (2) performance guides may be used as a blueprint for designing curriculum or used as teaching points for the instructor.

The bulk of the Catalog consists of tasks with their performance objectives and performance guides for the following areas of bank clerk occupations in the banking industry; verifying transaction amount, preparing bank items for dispatch, performing clerical duties, performing reconciliation duties, balancing accounts. The appendicies include a tool and equipment list, a source of references, and the original task inventory printout. (Author/PL)

ABSTRACT

Hansen, Philip W., Shelton, Rebecca L. and others.

A Catalog of Performance Objectives and Performance Guides, Diesel Mechanic.

Vocational-Technical Education Consortium of States, Commission on Occupational Education, Southern Association of Colleges and Schools, Atlanta, Georgia.

Publication Date--May 16, 1979

Note--84 pp.

Available From: V-TECS, Southern Association of Colleges and Schools, 795 Peachtree Street, N. E., Atlanta, Georgia 30308

The introductory section of the Catalog explains the reasons for the formation of the Vocational-Technical Education Consortium of States and the research methodology. The purpose of the catalog is to provide performance objectives and performance guides relating to the job content of Diesel Mechanics. A state-of-the-art study, conducted to assess the status of the domain of Diesel Mechanics, revealed some quality instructional materials which were used to develop a task list. After the preliminary task and equipment lists were reviewed and refined through interviews with incumbent workers, the occupational inventory booklet was distributed to 118 randomly selected incumbent workers to identify the tasks performed by diesel mechanics and the relative amount of time spent on each task. The analysis of the occupational inventory survey instruments provided data utilized by a writing team to select tasks and develop performance objectives and performance guides for each task. A field review survey was conducted to evaluate and revise the Catalog for the final printing. Suggested uses of the Catalog include: (1) performance objectives may be compared to existing program content for possible inclusion or adopted as the basis for new curriculum development; (2) performance guides may be used as a blueprint for designing curriculum or used as teaching points for the instructor.

The bulk of the Catalog consists of tasks with performance objectives and performance guides for the following areas of diesel mechanics: pre-maintenance testing; preforming engine disassembly; maintaining and servicing cylinder heads, flywheel, clutch, cooling systems, and fuel systems; and rebuilding engines. The appendices of the Catalog include a tool and equipment list, sources of standards, the state-of-the-art literature, and a cross-reference table of duties, tasks and performance objectives.

ABSTRACT

Smith, Charles W., Shelton, Rebecca L. and others.

A Catalog of Performance Objectives and Performance Guides, Meat Cutter.

Vocational-Technical Education Consortium of States, Commission on Occupational Education, Southern Association of Colleges and Schools, Atlanta, Georgia.

Publication Date--October 10, 1978

Note--150 pp.

Available From: V-TECS, Southern Association of Colleges and Schools, 795 Peachtree Street, N.E., Atlanta, Georgia 30308

The introductory section of the Catalog explains the reasons for the formation of the Vocational-Technical Education Consortium of States and the research methodology. The Catalog's purpose is to provide performance objectives and performance guides associated with occupational information relating to the job content of the Meat Cutter. A state-of-the-art study was conducted to assess the status of performance-based instructional materials and practices employed within the domain of Meat Cutting. Preliminary task and equipment lists were reviewed and refined through interviews with industry representatives and incumbent workers to produce the Meat Cutter Occupational Inventory Survey Booklet. The inventory booklet was distributed to a random sample of 158 incumbent workers who identified tasks performed on the job and the relative amount of time spent on each task. The job of writing performance objectives and performance guides for each task was completed by a writing team of six selected individuals. A field review survey provided information for revising components of the performance objectives and performance guides for the Final Catalog. Suggested uses of the Catalog include: (1) performance objectives may be compared to existing program content for possible inclusion or adopted as the basis for new curriculum development; (2) performance guides may be used as a blueprint for designing curriculum or used as teaching points for the instructor.

The Catalog consists of performance objectives and performance guides for tasks associated with the following areas of Meat Cutting: maintaining work facilities; packaging, displaying, and selling meats; receiving and storing meats; cutting and preparing beef, lamb, pork, and veal; and preparing special products. The Catalog appendices includes a comprehensive tool and equipment list, sources of standards, state-of-the-art literature, and an index of duties and tasks.

ABSTRACT

Leonard, Thelma H., Shelton, Rebecca L. and others.

A Catalog of Performance Objectives and Performance Guides, General House Worker.

Vocational-Technical Education Consortium of States, Commission on Occupational Education, Southern Association of Colleges and Schools, Atlanta, Georgia.

Publication Date--August, 1978

Note--188 pp.

Available From: V-TECS, Southern Association of Colleges and Schools, 795 Peachtree Street, N.E., Atlanta, Georgia 30308

The introductory section of the Catalog explains the reasons for the formation of the Vocational-Technical Education Consortium of States and the research methodology. The Catalog was designed to provide performance objectives and performance guides associated with current occupational information relating to the job content of the General House Worker. A state-of-the-art study revealed that the demand for household workers exceeded the supply since more women have entered the labor force. Adequate task and equipment lists were found in the literature review and input from interviews with incumbent workers helped to refine and produce the task inventory survey booklet. From a randomly selected sample of 158 incumbent workers, 134 usable inventory booklets were returned for a response rate of 84.8%. The survey responses were used as a basis for selecting the tasks for which performance objectives and performance guides were written. A writing team composed of six individuals developed each task for the catalog. A field review survey was conducted of the catalog to review and evaluate each element of the performance objectives and performance guides. Revisions in the Final Catalog were based on the field review evaluations. Suggested uses of the Catalog include: (1) performance objectives may be compared to existing program content for possible inclusion or adopted as the basis for new curriculum development; (2) performance guides may be used as a blueprint for designing curriculum or used as teaching points for the instructor.

The body of the Catalog consists of 130 tasks developed with performance objectives and performance guides for the following duty areas of the General House Worker: cleaning; planning and preparing meals; laundering clothes; serving foods and cleaning up after meals; caring for children; and performing other related activities. The appendices of the catalog includes a tool and equipment list, sources of standards, state-of-the-art literature, and an index of duties and tasks.

ABSTRACT

Wallette, Dennis

A Catalog of Performance Objectives and Performance Guides, Retail Credit Manager.

Vocational-Technical Education Consortium of States, Commission on Occupational Education, Southern Association of Colleges and Schools, Atlanta, Georgia.

Publication Date--April 24, 1979

Note--64 pp.

Available From: V-TECS, Southern Association of Colleges and Schools, 795 Peachtree Street, N.E., Atlanta, Georgia 30308

The introductory section of the Catalog explains the reasons for the formation of the Vocational-Technical Education Consortium of States and the research methodology. The Catalog's purpose is to provide performance objectives and performance guides relating to the job content of Retail Credit Managers. A state-of-the-art revealed that limited work existed in the area of Retail Credit Managers in the credit industry. Having established a need for such a task analysis, a preliminary task list was refined through interviews with incumbent workers. From responses to an occupational inventory booklet, a task list was produced ordering tasks from greatest time-spent to least time-spent. A writing team provided performance guides and a technical writer furnished the performance objectives. A Final Catalog incorporated revisions and corrections from a Field Review version. Suggested uses of the Catalog include: (1) performance objectives may be compared to existing program content for possible inclusion or adopted as the basis for new curriculum development; (2) performance guides may be used as a blueprint for designing curriculum or used as teaching points for the instructor.

The bulk of the Catalog consists of tasks with their performance objectives and performance guides for the following areas of Retail Credit Management: promoting new business, buying contracts from retail dealers, processing credit applications, keeping collections current, supervising office personnel, maintaining office supplies and equipment, and maintaining fiscal records. The appendices include a tool and equipment list, a source of references, and an index of tasks.